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Sansone

[54] INTRINSICALLY SELF DEFORMING FIBER OPTIC MICROBEND PRESSURE AND STRAIN SENSOR

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[58] **Field of Search** 385/13, 12; 250/227.14

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,795,232	1/1989	Persson	385/13
4,950,883	8/1990	Glenn	250/227.14
5,193,129	3/1993	Kramer	385/13

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[57] **ABSTRACT**

The present invention relates to a sensor for measuring pressure and strain. The sensor is formed by an optical fiber having at least one section wherein the fiber is twisted about itself. The at least one twisted section acts as an intrinsically self-deforming microbend deformer. The sensor further includes a source of light attached to a first end of the fiber and a power meter for measuring the amount of light lost in the at least one section. The optical fiber may have multiple twisted sections with different twist pitches and thus different sensitivities. In an alternative embodiment, the sensor may have two optical fibers twisted about each other.

15 Claims, 2 Drawing Sheets